power switch, the feedback circuit configured to receive the captured measurement and use the measurement[s] to control the [duty cycle] power switch to maintain the DC voltage substantially constant.

3. (Amended) The voltage regulator of claim 2, wherein the sampling circuit includes a capacitor, a first sampling switch connecting the capacitor to the output terminal, and a second sampling switch connecting the capacitor to the feedback circuit, so that the measurement is made when the first sampling switch opens, is stored as a charge [in] on the capacitor, and is provided to the feedback circuit when the second sampling switch closes.

5. (Amended) The voltage regulator of claim 4, wherein the sampling circuit includes a capacitor, a first sampling switch connecting a first plate of the capacitor to a first terminal of the power switch, a second sampling switch connecting a second plate of the capacitor to a second terminal of the power switch, and a third sampling switch connecting the capacitor to the feedback circuit, so that the measurement is made when the first and second sampling switches open, is stored as a charge [in] on the capacitor, and is provided to the feedback circuit when the third sampling switch closes.

9. (Amended) The voltage regulator of claim 8, wherein the feedback circuit uses an average of the first and second measurements to control the [duty cycle] power switch.

10. (Amended) [The] A voltage regulator [of claim 1,] having an input terminal to be coupled to an input voltage source and an output terminal to be coupled to a load, comprising:

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a power switch to alternately couple and decouple the input terminal to the output terminal;

a filter disposed between the input terminal and the output terminal to provide a substantially DC voltage at the output terminal;

a sampling circuit to make measurements of an electrical characteristic of the voltage regulator at discrete moments of time; and

a feedback circuit coupled to the sampling circuit and the power switch, the feedback circuit configured to use the measurements to control the power switch to maintain the DC voltage substantially constant; [,]

wherein the sampling circuitry includes a capacitor, a first sampling switch connecting the capacitor to an electrical path between the input terminal and the output terminal, and a second sampling switch connecting the capacitor to the feedback circuit.

Please add the following new claims:

23. (New) A voltage regulator having an input terminal to be coupled to an input voltage source and an output terminal to be coupled to a load, comprising:

a power switch to alternately couple and decouple the input terminal to the output terminal;

a filter disposed between the input terminal and the output terminal to provide a substantially DC voltage at the output terminal;

a sampling circuit to make a measurement of a voltage at the output terminal regulator at a discrete moment of time, the sampling circuit including a capacitor, a first sampling switch connecting the capacitor to the output terminal, and a second sampling switch, so that the measurement is made when the first sampling switch opens and is stored as a charge on the capacitor;

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and

a feedback circuit coupled to the second sampling switch of the sampling circuit, so that the measurement is provided to the feedback circuit when the second sampling switch closes, the feedback circuit configured to use the measurement to control the power switch to maintain the DC voltage substantially constant.

24. (New) A voltage regulator having an input terminal to be coupled to an input voltage source and an output terminal to be coupled to a load, comprising:

a power switch to alternately couple and decouple the input terminal to the output terminal;

a filter disposed between the input terminal and the output terminal to provide a substantially DC voltage at the output terminal;

a sampling circuit to make a measurement of a current passing through the filter at discrete moments of time, the sampling circuit including a capacitor, a first sampling switch connecting a first plate of the capacitor to a first terminal of the power switch, a second sampling switch connecting a second plate of the capacitor to a second terminal of the power switch, and a third sampling switch connected to the capacitor to the feedback circuit, so that the measurement is made when the first and second sampling switches open and is stored as a charge on the capacitor; and

a feedback circuit coupled to the third sampling switch of the sampling circuit so that the measurement is provided to the feedback circuit when the third sampling switch closes, the feedback circuit coupled to the power switch and configured to use the measurement to control the power switch to maintain the DC voltage substantially constant.